

***The Frontiers of Surface Chemistry and Heterogeneous Catalysis
Implications for ALS***

Gabor A. Somorjai

**Department of Chemistry and Lawrence Berkeley National Laboratory
University of California, Berkeley**

Abstract

Molecular level studies of surface revealed reconstruction of the surface structure for a large variety of solids ranging from metals to alkali halides and ice. Adsorbed atoms and molecules also induce restructuring (adsorbate induced restructuring) which appear to play important roles in bond activation (H-H, C-H, C-C, C=O, N \equiv N). Low coordination metal sites, clusters, step or kinks, are very active in bond activation and they restructure more readily. The aim of catalyst science is to produce systems that exhibit 100% selectivity. The molecular ingredients of selectivity will be reviewed and attempts to fabricate metal nanoparticles in two dimensions or in 3-dimensional framework to obtain high selectivity will be reviewed. Surface science focuses on polymers and proteins adsorbed on polymers to probe the causes of biocompatibility. New techniques permit the extension of surface chemistry into surface biology.